

Through the death of Prof. Bauerman one of the few members of the old school, of which his earliest teacher and greatest friend—Dr. Percy—was a type, has been lost to us; one of the most kindly and sympathetic friends to the younger members of his profession has passed away, and a most intimate companion, mentor, and friend has been lost to the writer. Only those who knew him can realise how great a loss is being experienced by his friends, and by the many councils and committees on which he served, and on which his wide experience of men and things rendered him so valuable.

Bauerman, like most great men, died in harness. Even on the day before his death he was occupied in dictating a review on a scientific work, and a few hours before he passed away peacefully in his sleep he was talking of his past labours and of the future work of the younger generation.

GEORGE T. HOLLOWAY.

#### THE NATURAL HISTORY MUSEUM.

THE Trustees of the British Museum have sent the subjoined correspondence to the *Times*, through Dr. F. G. Kenyon, director and principal librarian of the museum.

House of Commons, December 3, 1909.

Dear Sir Archibald,—At the meeting of the standing committee of the Trustees of the British Museum held on Saturday last at South Kensington, the letters which recently appeared in the *Times* relative to the connection of the Bloomsbury and South Kensington Departments of the British Museum and the relation of their respective Directors were very fully considered. It was unanimously felt that nobody could throw a clearer light upon the matter than yourself; that nobody's voice would be so well listened to; and that nobody's opinion would carry so much weight as your own, if you could be persuaded to give the benefit of your views on the question to your co-Trustees.

I understand that you have recently had occasion to inquire into this matter; may I venture, therefore, to invite you, as one of the Trustees of the British Museum, to be kind enough to inform your co-Trustees of the opinions which you hold upon the subject-matter in question?

If I might venture to suggest, the points upon which it appears to me desirable that we should be informed are (1) whether the Board of Trustees, acting through its standing committee, is in your judgment the best authority for the government of such an institution as the Natural History Departments of the British Museum, and (2) whether, under the existing statutes and rules, the scientific management of the Natural History Museum suffers any detriment from its association with the museum at Bloomsbury.

The Trustees are anxious to be reassured that the management of the Natural History Departments of the British Museum can be usefully, adequately, and properly carried on under the present system, and feel that, as you have recently had the subject before you, and have made special inquiries into it, your judgment upon it would carry special weight.

I may say that, at the meeting of the Trustees on Saturday, November 27, I was instructed by my colleagues to deal with this matter, and I have therefore the less hesitation in approaching you directly upon it.

I beg to remain, yours faithfully,

JAMES W. LOWTHER.

To Sir A. Geikie, F.R.S., Shepherd's Down,  
Haslemere.

Shepherd's Down, Haslemere, December 7, 1909.

Dear Mr. Speaker,—In reply to your letter of 3rd inst. I have pleasure in stating, for the information of my co-Trustees of the British Museum, the opinion which I have been led to form on the questions you refer to me. I may say that the agitation on this subject, which has been carried on, fitfully but persistently, in the public Press for many years, supported as it has been by some well-known

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men of science, created in my mind the impression that there was probably some ground for the complaints that had been brought forward. But not until recently have I had occasion to make a careful investigation of the facts of the case. The result of this inquiry has been to convince me that the agitation has no substantial justification, but has arisen from misapprehension or ignorance, and that if the actual state of the matter had been realised no agitation ought ever to have been started.

The allegation so constantly made that the Director of the Natural History Museum is under much more than the merely nominal control of the Director and Principal Librarian at Bloomsbury is without any real foundation. It has probably been suggested by the fact that, as both establishments are administered by one Board of Trustees, the financial business of the whole institution is entrusted to a single accounting officer. In this obviously convenient and economical arrangement the supervision has been assigned to the Director and Principal Librarian, to whom, by Act of Parliament, every other officer of the British Museum is subordinate. But he has no power whatsoever of interference in the scientific work or management of the Natural History Museum. The duties and responsibilities of the Director of the Natural History Departments at South Kensington, as laid down in the statutes and rules, are precisely the same as those of the Director and Principal Librarian in regard to the various departments at Bloomsbury. Each of these officers is charged with the independent control of the museum and staff over which he presides. Thus the subordination of the one Director to the other is, for all practical purposes, non-existent.

I cannot conceive of a scheme which, under a board of managers, could more fully secure liberty of initiation and action in each of the two establishments. Both Directors are in immediate touch with the Board of Trustees. This board is not a bureau of secretaries and clerks in a Government department, but a body of cultivated gentlemen, full of sympathy with the objects of the great institution committed to them, anxious to promote its interests, and ready at all times to seek the best expert advice in matters which may lie beyond their personal cognisance.

It is, of course, not to be expected that any set of regulations, how carefully soever they may have been framed, will provide for every contingency that can arise from the effects of personal idiosyncrasies. In the conduct of any public institution it must be assumed that the duties assigned to the various officers of the staff will be discharged with courtesy, good feeling, and loyalty to the service. Where, unhappily, these fundamental qualities prove deficient, friction is not unlikely to arise; but any instance of it can be dealt with by the governing authority, and should not imply the necessity for a revision of the statutes, still less for a reorganisation of the institution. After a fairly wide experience, I have no hesitation in asserting that I know of no establishment, either in this or any other country, wherein more favourable conditions have been provided for harmonious and effective cooperation in scientific work than have been devised by the Board of Trustees of the British Museum for the administration of the important departments committed to their care.

I remain, yours very faithfully,

ARCH. GEIKIE.

To the Right Honourable the Speaker of the House of Commons.

#### NOTES.

WE announce with deep regret that Dr. Ludwig Mond, F.R.S., died on Saturday, December 11, at seventy years of age.

WE regret to see the announcement that Sir Alfred Jones, K.C.M.G., who rendered valuable services to science by the share he took in the foundation and endowment of the Liverpool School of Tropical Medicine, died on December 13, at sixty-four years of age.

MR. W. M. TATTERSALL has been appointed keeper of the Manchester Museum in succession to Dr. W. E. Hoyle.

WE learn from the *Revue scientifique* that a monument is to be erected to the memory of Laplace at Beaumont, in Auge (Calvados), where the illustrious mathematician was born in 1746.

By the will of Mr. G. Crocker, who left an estate of 6,000,000*l.*, Columbia University will receive a fund estimated at 300,000*l.* for the investigation of cancer.

THE Stockholm correspondent of the *Times* announces that the Nobel prizes for this year have been awarded as follows:—medicine, Prof. T. Kocher, Berne; chemistry, Prof. W. Ostwald, Leipzig; physics, Mr. Marconi and Prof. K. Braun, Strassburg.

THE Rome correspondent of the *Times* states that the second general meeting of the International Institute of Agriculture was held there on December 12, and was fully attended by the foreign delegates, of whom more than one hundred were present.

At the annual business meeting of the Scottish Meteorological Society, held on December 8, Prof. A. Crum Brown, F.R.S., was elected president in succession to the late Sir Arthur Mitchell, K.C.B.; Sir A. Buchan-Hepburn, Bart., and Mr. J. Mackay Bernard, vice-presidents; Mr. R. T. Omond and Mr. E. M. Wedderburn, honorary secretaries; and Mr. W. B. Wilson, honorary treasurer.

THE selected subject of the essay for the Weber-Parkes prize and medals, to be awarded by the Royal College of Physicians in 1912, is "The Influence of Mixed and Secondary Infections upon Pulmonary Tuberculosis in Man, and the Measures, Preventive and Curative, for dealing with Them." All essays, together with any preparations made in illustration of them, must be transmitted to the registrar of the college during the last week of May, 1912.

ON November 24, exactly fifty years after the publication of the "Origin of Species," a number of biological and medical societies of the Netherlands met in one of the large halls of the Amsterdam Zoological Gardens (*Natura Artis Magistra*) to commemorate this event and the immense and beneficial influence which Darwinism has continued to exercise on human thought since then. Addresses were delivered by Prof. Hugo de Vries on Darwin's visit to the Galapagos Archipelago, and by Prof. A. A. W. Hubrecht on Darwin and the descent of man. The hall was crowded to overflowing, and lavishly decorated with plants, a bust of Darwin occupying the centre in front of the platform. Altogether, the commemoration was impressive and the enthusiasm spontaneous.

At the monthly meeting of the governors of the Imperial College of Science and Technology held on December 10, a letter was presented from Dr. Henry T. Bovey, F.R.S., tendering his resignation as rector. It is understood that this step has been taken owing to the condition of Dr. Bovey's health. The resignation, which came as a great surprise, was accepted with the deepest regret, and reference was made to the rector's great devotion to, and keen interest in, the important work which he had so recently undertaken, and to his unfailing courtesy and consideration in his dealings with all. Dr. Bovey was appointed rector in May of last year; and the new institution has derived a great advantage from his organising power and educational experience. The governors will shortly appoint a successor.

THE *Times* of December 9 gives an account of the results of a successful expedition, under MM. Paul Pelliet and

Nonette, which has just returned from Central Asia. The mission was equipped by the Comité de l'Asie française, the Ministry of Public Instruction, the Académie des Inscriptions et Belles Lettres, and a number of other societies, aided by private subscribers, the total cost being about 16,000*l.* It has accomplished topographic surveys (by Dr. Vaillant) over a distance of 3000 kilometres, on a route from Andijan, in Russian Turkestan, to Chongchu, on the Peking-Hankau line, across the Taldyk Davan range, where a height of 13,000 feet was attained. The results have been remarkable from the point of view of natural history and anthropology, but the archæological and bibliographical discoveries have surpassed all expectations. At Twen Hwang wooden statues and paintings on silk, alleged to be of date anterior to the eleventh century, were secured, also a whole library, including a Nestorian manuscript, printed records, and records stamped on wood, of the seventh century, most of them unknown in Europe and in China itself. These collections will be added to the Chinese section of the National Library.

A STATEMENT of the progress being made with the preparations for Captain Scott's Antarctic Expedition has been communicated to Reuter's Agency. Dr. Wilson, chief of the scientific staff, will also be the zoologist and artist. It is anticipated that three geologists will accompany the expedition, and that one of these will be Mr. Mackintosh Bell, director of the Geological Survey of New Zealand, who has volunteered his services. Mr. R. Simpson, of the Indian Survey Department, will be the physicist of the expedition. He is now on his way to England from Simla. A second physicist will be taken. There will be two, or possibly three, biologists. With Dr. Wilson will be associated a second medical man, who will study botany and bacteriology, giving particular attention to the investigation of blood parasites. The services of Mr. C. R. Meares, who lately completed a journey on the Chino-Tibetan border, have been secured for the expedition. He will leave England almost at once for eastern Siberia to obtain the ponies and dogs. He will collect the animals at Vladivostok, from which place they will be sent to Kobe and trans-shipped for Australia and New Zealand. Mr. Meares will join the expedition in New Zealand.

WE learn from a report recently issued by the United States Department of State that during the first Pan-American Scientific Congress, held at Santiago, Chile, in January last, the following resolution on the universal time system, based on the Greenwich meridian, was submitted by Prof. David Todd, of Amherst College, U.S.A., and unanimously adopted:—Whereas (1) in the relations between the peoples of the world, diplomatic, commercial, or other, a standard of time is a common and well-recognised benefit to all; and whereas (2) the world standard of universal time, based on the division of the globe into hourly belts reckoned from a common origin, has now been in use with indisputable advantages since November 18, 1883, in certain countries; and whereas (3) practically all the European countries, Egypt, South Africa, India, Burmah, Australia, Japan, New Zealand, Canada, the United States, and other countries, have already adopted this system of universal time; and whereas (4) the necessary time-signals are now sent out daily, with all essential accuracy and without cost, throughout the American continent, by cable or wireless telegraphy: *Be it resolved*, that the first Pan-American Scientific Congress urge upon such Governments as may not already have taken this step the adoption of the universal time system referred to the meridian of Greenwich, to be effective from January 1, 1910. This comprehensive endorsement of world time by



the Latin-American countries forms a fitting recognition of the twenty-fifth anniversary of the inception of a time system which has wrought all the advantages that its originator, Sir Sanford Fleming, foresaw. At the instance of Prof. Todd's representations to these Governments, both Peru and Panama had already adopted standard time officially in 1908.

THE sixty-first meeting of the American Association for the Advancement of Science is to be held in Boston, at the invitation of Harvard University and the Massachusetts Institute of Technology, from Monday, December 27, to January 1, 1910. The president of the meeting will be Dr. David Starr Jordan, of the Leland Stanford Junior University. Addresses of welcome will be delivered by Dean W. C. Sabine for Harvard University and by President R. A. Maclaurin, of the Institute of Technology. The retiring presidents of the sections, with the subjects of their addresses, so far as announced, are as follows:—mathematics and astronomy, Prof. C. J. Keyser, the thesis of modern logistic; social and economic science, Prof. W. G. Sumner; geology and geography, Mr. Willis; zoology, Prof. C. Herrick, the evolution of intelligence and its organs; physics, Prof. K. E. Guthe, some reforms needed in the teaching of physics; botany, Prof. H. M. Richards, the nature of response to chemical stimulation; chemistry, Prof. L. Kahlenberg, the past and future of the study of solutions; physiology and experimental medicine, Prof. W. H. Howell; mechanical science and engineering, Prof. G. F. Swain, the profession of engineering and its relation to the American Association for the Advancement of Science; education, Prof. Dewey, science as a method of thinking and science as information in education; anthropology and psychology, Prof. R. S. Woodworth, racial differences in mental traits. The presidents of sections for the meeting are as follows:—mathematics and astronomy, Prof. E. W. Brown, Yale University; physics, Dr. L. A. Bauer, Carnegie Institution; chemistry, Prof. W. McPherson, Ohio State University; mechanical science and engineering, Mr. J. F. Hayford, U.S. Coast and Geodetic Survey; geology and geography, Mr. R. W. Brock, Canadian Geological Survey; zoology, Prof. W. E. Ritter, University of California; botany, Prof. D. P. Penhallow, McGill University, Montreal; anthropology and psychology, Dr. W. H. Holmes, Bureau of American Ethnology; social and economic science, Mr. B. W. Holt; physiology and experimental medicine, Prof. C. S. Minot, Harvard Medical School; education, Prof. J. E. Russell, Columbia University, New York. A popular lecture will be given during the evening of December 28 by Dr. C. W. Stiles, of the Boston Public Health and Marine Hospital Service, on the hook-worm disease in the south.

WE have to acknowledge the receipt of a copy of an article on Darwin, by Prof. A. A. W. Hubrecht, published in *De Gids*, No. 12; also of one by Dr. Angel Gallardo on "Las Investigaciones Modernas sobre la Herencia en Biología," extracted from a volume published at Cordoba to commemorate the retirement of Dr. R. Wernicke from the faculty of medicine. The latter deals largely with the main principles of the Mendelian theory.

CRUSTACEANS form the subject of two articles published in part i. (London: Williams and Norgate) of a report to the Government of Baroda on the marine zoology of Okhamandal, in Kattiarwar. In the first of these Messrs. J. Hornell and T. Southwell describe a new species of pea-crab of the genus *Pinnotheres* infesting window-oysters (*Placuna*), and remarkable for the number and large size of the males, while in the second Mr. Southwell discusses the anomorous crustaceans of the same area.

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THE practical improvement of ethnological collections in provincial museums forms the subject of the chief article in the November number of the *Museums Journal*, the article being an address read by Mr. F. W. Knocker at the Museums' Conference at Maidstone last summer. It is pointed out that valuable objects of this nature preserved in local museums are frequently assigned to countries wholly different from those from which they originally came, and that urgent need exists for intelligent geographical classification of such collections.

To the Transactions of the Edinburgh Field Naturalists' and Microscopical Society for 1908-9 (vol. vi., part ii.) the Rev. D. W. Wilson contributes some interesting notes on birds mentioned in early Scottish literature and documents, from which it is made evident that the crane was formerly common in Scotland, thus adding strength to the opinion of the late Mr. T. Southwell that it formerly bred in East Anglia. In another paper in the same issue Mr. J. C. Adam directs attention to the long nesting-period of the more typical members of the crow-tribe, a fact to which no allusion appears to be made in bird-books. Fourteen days for incubation and another fourteen for the nestlings to acquire their feathers is, for instance, the length of the nesting-period in the case of the thrush. In the case of the rook, on the other hand, the eggs are brooded for seventeen days, and the young require another twenty-seven or thirty days in the nest, making the whole nesting-period nearly seven weeks. The carrion-crow requires an additional week, while the raven seems to take about a week more than that species.

THE need of a regular study of the sequence of plumages in birds forms the subject of an editorial article in the December number of Witherby's *British Birds*. It is pointed out that when a bird first leaves the nest it is either naked or clothed with a down-plumage. The latter is succeeded by a juvenile plumage, acquired by a complete moult. In a few instances this juvenile dress may perhaps be indistinguishable from that of the adult, but in most cases, at any rate, it is generally possible, and often easy, to differentiate between the two. In some instances, when the dress of the adults of the two sexes is different, the juvenile plumage approximates more or less closely to that of the female, but more commonly it is markedly different from that of both adults. It may be spotted or streaked, it may show light borders to the feathers, it may be duller than that of the adult, or may be altogether distinct. It is proposed to institute a careful study of these early plumages of British species, and then of their successive summer and winter liveries season by season.

In a report on the progress of game-protection in the United States during 1908, published in the Year-book of the Department of Agriculture, Mr. T. S. Palmer states that the year 1908 was not marked by any event of special importance, but a number of factors, at least in certain localities, affected the condition of game and the success of the hunting season. On the whole, the game wintered well, and conditions in the spring were better than normal. During the summer a prolonged drought, accompanied by forest-fires, occurred in several of the northern States, and threatened serious injury to deer and grouse, but the loss proved less than predicted. In the Carolinas and Georgia floods in August and September caused great destruction of deer and wild turkeys. The difficulty of obtaining game-birds for stocking coverts increased interest in the grey partridge of Europe, and resulted in the importation of a much larger number of these birds than in any previous year. The rapidly increasing popularity of the automobile and the motor-boat in the pursuit of game is apparently

affecting the abundance of certain species in some localities, and indicates the necessity for better regulation of such methods of hunting.

IN a recent number of the Proceedings of the Zoological Society of London (October) Dr. F. Wood-Jones gives an abstract of his remarks on the new theory he has formulated on the origin of coral reefs and atolls. According to his view, the presence or absence of sedimentation determines, in the first place, whether the reef corals are not, or are, able to form a reef on a submerged bank. The tendency of reefs, once started, to become "basin-shaped" is due to the sediment that falls and settles on the side of the reef that is protected by the growing corals from the washing action of the sea currents. When the reef reaches the tide limit the waves hammer fragment against fragment and form a quantity of coral débris, which becomes cemented into a solid breccia to form the basis of the coral island. A small coral island once formed in this manner provides an impediment to the current, and the burden of sediment the current carries is deposited in stream lines from its extremities. "In this way the form of the island tends to become a crescent." The theory is ingenious and full of interest, but until the full paper, which we may hope will be adequately illustrated, is before us, it is difficult to believe that it will entirely supplant the older theories of "subsidence" or of "solution." Neither the simple and beautiful theory of Darwin nor the more complicated but still fascinating theory of Sir John Murray have received universal support; it is hardly possible that Dr. Wood-Jones's theory of sedimentation will prove to be capable of solving all the difficulties.

THE first appendix to the *Kew Bulletin*, 1910, has been issued. It contains, as usual, the list of seeds of hardy herbaceous plants and of trees and shrubs which have ripened at Kew during the year and are available for exchange with botanic gardens and regular correspondents.

A PAPER of much interest contributed by Dr. Th. Weevers to *Recueil des Travaux botaniques Neerlandais* (vol. vi.) discusses the physiological significance of some glucosides. The author previously studied the glucoside, salicin, present in twigs of *Salix purpurea* as a reserve product, and observed that when the shoots start growing it gives place to a body saligenin, and apparently this in turn to catechol. He now reports the discovery of the enzyme, salicase, which decomposes salicin. Further, he identifies two oxidation ferments, which act upon saligenin and catechol respectively. These and other results lead to the following argument. During the summer salicin is formed in the leaves by day, but is decomposed by night, and the glucose is transported to the cortex; each day the catechol combines with more glucose to form salicin. In the autumn the process ceases, because the cortex contains as much salicin as the leaves. These conclusions agree with the hypothesis that benzene derivatives combine with carbohydrates to form substances which diffuse with difficulty, and that serve to keep the sugar stored in the tissues.

AN essential feature of the scientific investigations undertaken at the Rothamsted Experimental Station is the practical bearing of the problems involved; this is evident in the papers originally published in the *Journal of Agricultural Science* (October), now issued in pamphlet form from the Cambridge University Press. A communication by Drs. E. J. Russell and H. B. Hutchinson deals with the effects produced by partial sterilisation of soils. When a soil is heated to 95° C. or treated with volatile antiseptics, e.g. carbon bisulphide, it becomes more productive

for a while. The authors find that there is an increase in the production of ammonia, which is due to a rapid increase of bacteria. Reasons are given for believing that the chief factor is the destruction by sterilisation of large competing organisms of the nature of protozoa. If this be so, it is possible that some method may be devised for suppressing these undesirable soil organisms, and the authors state that this practical question is receiving attention. Drs. H. B. Hutchinson and N. H. J. Miller have attacked the problem of nitrogen assimilation by plants to test the evidence in favour of direct absorption of ammonium salts. Experiments were conducted with wheat and peas grown in water and sand cultures under the conditions necessary for excluding nitrifying organisms. The results show that these plants can take up their nitrogen entirely in the form of ammonium sulphate, although wheat thrives better when supplied with a nitrate. It is mentioned that other investigators have found a partiality for ammonium salts in the early stages of a plant's existence, while nitrates have been necessary or more fruitful in later stages.

SOLID carbon dioxide is now being used for refrigeration in the treatment of certain affections of the skin. The substance is obtained in the form of a snow by allowing the gas to escape from a cylinder in which it is compressed. This snow is placed within a tube of metal or vulcanite, and packed by using a solid rod which fits into the tube as a rammer. In this way round or square rods of solid carbon dioxide can be obtained. A rod may be held in the hand with a turn or two of lint intervening, and the free end may be pared to any shape by means of a knife, as it is quite firm. On applying the end of a rod of this kind to the skin with pressure, the frozen surface immediately becomes white and hard. The process of thawing occupies about the same time as the application. Reaction sets in at once, the treated area becoming perceptibly swollen in two or three minutes. A wheal forms within half an hour, and often a blister is produced within an hour, though with short applications this does not occur. An application of thirty seconds or more is followed by scarring. The application is practically painless. The method is chiefly of use in the treatment of capillary nævi of less than 1 inch diameter. The average duration of the application is about forty seconds. "Port-wine mark" is dealt with in this way. Some moles are amenable to this treatment, and it answers well for warts. In the case of warts a longer application is necessary, say one to one and a half minutes, pressure being continued until a narrow zone of healthy tissue is frozen around the base of the wart. Keratoses (horny growths of the skin) are among the diseases amenable to this method of treatment. It is too early to say what will eventually be the scope and limits of the therapeutic utility of this agent, but the method is of interest as an instance of another application of physics to medicine.

It is well known that in animals such as the vertebrates, which have a closed vascular system, the nutrient function of the blood is exercised upon the tissues through the intermediation of lymph, that is, the fluid part of the blood which leaks through the thin walls of the blood-capillaries. The problem of lymph formation is fraught with interest, and has exercised the attention of many physiologists. The word leakage just employed, however, implies that the main factor in its formation is the mechanical one of filtration, but this is by no means the truth, or at any rate the whole truth. Osmosis is another physical process concerned, and the labours of physical chemists in elucidating the laws of osmosis have been important from the physiological point of view; but, in

addition to physical forces, the physiological or "vital" properties of the living capillary wall have to be taken into account, and the secretory nature of lymph formation was ably insisted upon by the late Prof. Heidenhain. A somewhat similar set of factors has to be reckoned with in the question of urine formation in the kidneys, and different physiologists hold diverse views concerning the relative importance of the physical and physiological factors concerned. Those interested in the latest development of such discussions, mainly in relation to the formation of lymph, will find them ably discussed in a little pamphlet written by Prof. Asher, of Berne, who has devoted much of his research work in this direction. It is entitled "Der physiologische Stoffaustausch zwischen Blut und Geweben," and though published separately it forms part of a larger work which is being written by collaboration under the editorship of Profs. Gaupp and Nagel, called "Sammlung anatomischer und physiologischer Vorträge und Aufsätze" (Jena: G. Fischer).

MISS E. B. VAN DEMAN contributes to the Proceedings of the Carnegie Institution of Washington an elaborate monograph on the Atrium Vestæ at Rome. This building was first discovered in 1883 at the foot of the Palatine Hill in the Forum, and the excavations have been since carried on at intervals. The investigation of the site is particularly difficult, because, owing to successive outbreaks of fire, the building was reconstructed or restored no less than five times from the Republican period down to that of the later Empire. The most interesting point disclosed by the excavations is that the dwelling of the Vestal Virgins, who guarded the sacred fire, was an adjunct to that of the early king and queen. The queen, as mater-familias of the State, supervised the duties of the Vestals. This fact furnishes strong evidence in support of the theory enunciated by Prof. J. G. Frazer, some five-and-twenty years ago, that the Vestals were originally the daughters of the king, and as such were naturally placed in charge of the sacred fire which was kept alight in the house of the king, and on its maintenance the safety of the State was supposed to depend.

THE December number of the *Geographical Journal* contains a second interim report of the committee of the society on progress in the investigation of rivers, by Dr. Aubrey Strahan. The chief work of the year includes observations of flow, temperature and composition of water, and estimations of dissolved and suspended matter, in the rivers Exe and tributaries, the Medway, and the Severn. A number of notes on special points is appended to the report, and Dr. Mill contributes an extremely valuable paper on the rainfall of the Exe Valley.

MR. V. STEFÁNSSON contributes a short paper on northern Alaska in winter to the Bulletin of the American Geographical Society. The author points out that whereas driftwood was formerly abundant along the entire north coast of Alaska, very little now comes ashore anywhere west or south from Point Barrow, showing that this section of the coast depends for its driftwood on the Yukon River, the banks of which have recently been deprived of much of their tree-growth. A few years ago the Eskimos of northern Alaska might have been broadly classified as inlanders and coast people, but now most of the inlanders have moved to the coast, starved out by the disappearance of the caribou, which has been slaughtered indiscriminately for about twenty years.

In the Journal of the Scottish Meteorological Society for the year 1908 (vol. xv., third series) Mr. A. Watt, secretary to the society, gives a very interesting summary of the

development of the exploration of the upper air by means chiefly of kites and unmanned balloons, from the early experiments of Wilson, Archibald, and others in Great Britain, and Espy, Rotch, and others in the United States, until the present time, together with a brief description of the results relating (1) to the general circulation of the atmosphere, and (2) to the temperature conditions at great heights. It is not claimed that anything new is contained in the paper, but it gives historical notes, and references to original discussions that have appeared in our own columns and other journals of a scientific character, which will be very useful to anyone interested in this important subject. The author thinks that these researches are "perhaps the most brilliant chapter in the history of meteorology."

IN the *Physikalische Zeitschrift* for November 22 Dr. T. Wulf directs attention to the advantages of using calcium carbide as a drying material in electrostatic instruments the insulation of which is to be maintained. He has found that a small piece of the substance will keep the interior of an electroscope he uses for measuring the  $\gamma$  rays from radio-active materials quite dry for several weeks, although the instrument stands in the open exposed to rain. The active surface of the material is kept free owing to the dry powder due to its action falling from the surface as it is formed. The efficiency of the carbide seems to be rather better than that of sodium.

MISS LAURA L. BRANT, of the Brown University, Providence, gives in the November number of the *Physical Review* the results of her re-measurement of the magnetic and electrical properties of a score of steel rods which were made glass-hard and then tested by Prof. Barus in 1885. They were again tested by him in 1888 and in 1897, so that we now have a record of the change of the properties of this steel when kept at ordinary temperatures for twenty-four years. In all cases there has been a diminution of the electrical resistivity of the steel of about 20 per cent. in the twenty-four years, the change having taken place along an exponential curve. The same result would have been reached in three hours if the rods had been heated to 100° C. Miss Brant concludes that glass-hard steel will, if kept at ordinary temperatures, be completely softened in 250 years.

MR. E. MERCK, 16 Jewry Street, E.C., has issued his annual report of recent advances in pharmaceutical chemistry and therapeutics for 1908, vol. xxii., dated from Darmstadt, August, 1909. The present volume has grown to nearly 400 pages, the index of authors alone covering thirty columns, and including more than 1000 names. A hundred pages are devoted to a monograph on organo-therapy and organo-therapeutic preparations, the remainder of the report being occupied with detailed notes on preparations and drugs, these being arranged in alphabetical order for convenience of reference.

MR. L. OERTLING has sent us a copy of his new illustrated catalogue of assay, chemical, and bullion balances. More than fifty balances are illustrated, ranging from a bullion balance constructed to carry 10,000 oz. and turn with 10 grains, to an assay balance carrying 1 gram and weighing to 0.005 milligram. Among the new balances not previously shown is the ampere balance made for the National Physical Laboratory, weighing to a milligram when loaded with 5 kilograms in each pan. In the case of the weights, it would be desirable to indicate the accuracy of adjustment, if only as explaining the apparent anomaly, a set of weights ranging from 50 grams to 1 milligram being quoted at 2l. 5s. on p. 59 and at 15s. on p. 61.



MESSRS. GALLenkAMP AND CO., LTD., have favoured us with a copy of their catalogue of spectroscopes, spectrometers, vacuum tubes, induction coils, and other accessories essential to modern spectroscopical research. After examining the publication carefully we recommend all who are engaged or interested in such work to acquire a copy, for it is plentifully illustrated, the instruments are described in detail, and instructions are given as to how they should be set up for the best use in various researches. The accessories for the production of spectra, such as tubes, burners, coils, and cells, are very numerous, and the firm makes a speciality of vacuum tubes to which we have previously directed attention (vol. lxxi., p. 448). The "C" type of tube, in which the illuminated gas is viewed end on in a capillary tube, without the interference of the electrodes, is now made in Uviol glass and with ground-in quartz windows, so that investigations of the ultra-violet part of the spectrum may be carried out with the various ultra-violet spectrographs figured and described in the catalogue.

SOME results of trials of the new transmission gear for marine turbines constructed for Mr. George Westinghouse to the designs of Rear-Admiral George W. Melville and Mr. John H. Macalpine appear in *Engineering* for December 3. In this gear the reduction of speed from 5 to 1 is attained by the use of double helical spur wheels and pinions mounted in such a manner as to secure an even distribution of the bearing pressure between the teeth. The full load to be transmitted is 6000 horse-power at 1500 revolutions of the pinion shaft, and a special hydraulic brake was employed in the tests to take up the load. A few of the results are given in the following table:—

B.H.P. delivered by gear	3712	4156	4576	5036	5486	5927
B.H.P. of turbine	3771	4197	4623	518	5567	6057
Efficiency, per cent.	98.7	99	98.9	98.7	98.5	98.7

This efficiency is very remarkable, being as good as has been recorded with the best cut gears of ordinary dimensions. An endurance test of the gear at full load has also been carried out, extending from 3.15 on Saturday afternoon until 7.15 the next Monday morning. During the last thirty-four hours of the run the temperature of the gear remained constant, and there was every indication that the trial could have been extended indefinitely. The performances of this gear on board ship will be looked for with interest, both as regards the working of the gear and the anticipated economy which will result by running both turbine and propeller at their best speeds.

THE conditions of award of the prize of 1000*l.* offered by Mr. Alexander for a British-built aeronautical engine have now been issued. We extract the essential conditions from *Engineering*, as follows. The engine must develop not less than 35 brake-horse-power, and not exceed 245 lb. weight; that is, 7 lb. per horse-power, including all parts necessary for running, cooling apparatus, and accessories. Arms suitable for bolting down to a testing bed are included in the weight, and such arms must be arranged so that the motor-shaft is not less than 16.13 inches above the test-bed. The points on which the award will be given are:—(a) weight and petrol consumption; (b) trustworthiness and steadiness of running; (c) wear of working parts; (d) security against fire; (e) air-resistance offered by motor. Each motor will be tested on a 24-hours' run, and if the stoppages during this time exceed three, or if the total time of stoppage exceeds thirty minutes, the motor will be disqualified. The balancing will be taken into consideration, and the engine will also be tested at an inclination of 15 degrees, first one way and then the other, an hour's run each way being given. A thrust of 175 lb. will

be applied during the tests to represent the thrust of the propeller. The tests will be made in an air current of thirty miles per hour. The regulations comprise subsidiary details, but the above are the essentials. The tests will be carried out at the National Physical Laboratory under the sole control of the advisory committee, and entries may be made not earlier than February 1 and not later than April 30 on entry forms which may be obtained from the secretary, advisory committee for aeronautics, Bushy House, Teddington.

MESSRS. LONGMANS, GREEN AND CO. have published a seventh edition of Prof. W. D. Halliburton's "Essentials of Chemical Physiology for the Use of Students." Scarcely a page of the book has escaped revision, and a new lesson on some typical organic compounds has been included in the book.

A THIRD edition of the "Elementary Treatise on Electricity and Magnetism," by Prof. G. Carey Foster, F.R.S., and Prof. A. W. Porter, has been published by Messrs. Longmans, Green and Co. The whole book has been revised, and many additions have been made. The final chapter has been re-written, and provides a good summary of recent progress in electrical science.

MR. M. KANADE, Baroda, India, has sent us a copy of a list of books he has compiled and classified according to the system, known as the decimal classification and relative index, devised by Mr. M. Dewey, director of the New York State Library. The catalogue does not make it quite clear how the books chosen for classification have been selected, but the scheme provided for the classification of the works in any library should prove useful.

## OUR ASTRONOMICAL COLUMN.

DANIEL'S COMET, 1909*e*.—A second observation by Prof. Daniel of the comet discovered by him on December 6 is reported by a telegram from the Kiel Centralstelle, and the following elements and ephemeris, computed by Dr. Ebell from observations made at Princeton (December 7), Northampton (December 8), and Nice (December 9), are published in Circular No. 116 from the Kiel Centralstelle:—

### Elements.

$T = 1909$ , December 5.6011 (Berlin).

$\omega = 8^{\circ} 16' 42''$

$\Omega = 71^{\circ} 33' 08''$  1909*o*

$i = 26^{\circ} 56' 90''$

$\log q = 0.19674$

### Ephemeris 12h. (M.T. Berlin).

1909	$\alpha$		$\delta$	$\log \Delta$	Bright- ness
	h.	m.			
Dec. 13	6	18.1	+39 31.0	9.789	0.99
15	6	18.4	+41 6.2		
17	6	18.7	+42 38.8	9.794	0.96
19	6	18.9	+44 8.4		
21	6	19.0	+45 34.7	9.802	0.92

As the comet is travelling northwards through Auriga, nearly parallel to the line joining  $\theta$  and  $\beta$  Aurigæ, it will probably remain observable in the northern hemisphere for some time.

The above elements show a likeness to those of comet 1867 I., but are, as yet, too uncertain to permit of any definite conclusions.

It will be seen from the ephemeris that the comet is now receding from the sun, and is becoming fainter; the unit brightness, at time of discovery, was given as 11.0.

HALLEY'S COMET, 1909*c*.—A further ephemeris for Halley's comet, based on the assumption that perihelion passage will take place at 1910 April 19.67, is published in No. 416 of the *Observatory* (December, p. 476), and extends to April 5.1 (Berlin Time). In the interval the comet will pass from Taurus, through Aries, graze the